

Appl. No. : 10/786,339
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AMENDMENTS TO THE CLAIMS

1-31. (Canceled)

32. (Currently amended) A filter device for being implanted in a blood vessel for carrying out *in-vivo* plasma separation comprising:

a plurality of elongated hollow tubes and a plurality of elongated fibers each fiber having a microporous membrane fiber wall with an outer wall surface and an inner wall surface defining an interior lumen extending along the length thereof wherein the fiber wall morphology of each of the elongated fibers is asymmetrical between the inner wall surface and the outer wall surface, said fiber wall having a higher mass density zone adjacent to the outer wall surface and a lower mass density zone adjacent to the inner wall surface, said higher mass density zone having a smaller average nominal pore size than the average nominal pore size in the lower mass density zone, each fiber having a first end and a second end secured to said elongated hollow tubes, wherein the interior of the said plurality of elongated hollow tubes communicates with the interior lumen of each of the fibers, said fibers including one or more continuous filaments embedded in the microporous fiber wall between the first and second ends of the fiber.

33. (Canceled)

34. (Currently amended) A filter device of Claim ~~33~~32 wherein said plurality of elongated hollow tubes comprises one or more first and one or more second elongated hollow tubes extending substantially parallel along the length thereof, and wherein a first end of each of said elongated microporous fibers is secured to the first hollow tube and a second end of each of said fibers is secured to the second hollow tube whereby the interior fiber lumen of each fiber communicates with the interior of the first and the second hollow tube.

35. (Original) A filter device of Claim 34 comprising two of said elongated hollow tubes, each of said tubes having a plurality of holes spaced apart along a substantial portion of the length thereof, each hole receiving a first or a second end of an elongated microporous fiber.

36. (Currently amended) A filter device of Claim ~~33~~32 wherein said one or more filaments extend along said fiber wall substantially uniformly between said inner wall surface and said outer wall surface.

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37. (Currently amended) A filter device of Claim ~~33~~32 wherein said one or more filaments extend along said fiber wall substantially equidistant between said inner wall surface and said outer wall surface.

38. (Original) A filter device of Claim 32 wherein the one or more filaments have a substantially uniform tensile strength along the length thereof.

39. (Original) A fiber of Claim 32 wherein said one or more filaments occupy less than about 15% of the fiber wall cross-sectional area of said fiber.

40. (Original) A fiber of Claim 32 wherein said one or more filaments occupy less than about 10% of the fiber wall cross-sectional area of said fiber.

41. (Previously presented) A filter device of Claim 32 wherein each of said one or more filaments has a cross-sectional area occupying between about 0.1% and about 2% of the cross-sectional area of said fiber.

42. (Original) A fiber of Claim 32 wherein each of said one or more filaments has a cross-sectional area occupying between about 0.2 and about 2% of the cross-sectional area of said fiber.

43. (Original) A filter device of Claim 32 comprising a plurality of said filaments and wherein each filament has a cross-sectional area occupying between about 0.2% and about 2% of the cross-sectional area of said fiber.

44. (Original) A filter device of Claim 32 wherein said one or more filaments have a tensile strength of at least about 5,000 psi.

45. (Original) A filter device of Claim 32 wherein said one or more filaments comprise fiberglass, polypropylene, silk, polysulfone, polyethersulfone, polyimide, polyamide or aramid.

46. (Original) A filter device of Claim 32 comprising two of said filaments.

47. (Original) A filter device of Claim 46 wherein said one or more filaments comprise fiberglass, polypropylene, silk, polysulfone, polyethersulfone, polyimide, polyamide or aramid.

48. (Original) A filter device of Claim 47 wherein each of said one or more filaments has a cross-sectional area occupying between about 0.2% and about 2% of the cross-sectional area of said fiber.

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49. (Previously presented) A filter device of Claim 47 comprising a plurality of said filaments occupying between about 0.5% and about 5% of the cross-sectional area of said fiber.

50. (Original) A filter device of Claim 33 wherein the fiber wall structure comprises a continuous change in mass density from the outer wall surface to the inner wall surface.

51. (Original) A filter device of Claim 50 wherein the fiber wall structure comprises a continuum of voids bounded by solid frames.

52. (Currently amended) A filter device of Claim ~~33~~32 wherein said membrane fiber wall has two mass density zones and wherein each of said zones is characterized by a different average nominal pore size.

53. (Currently amended) A filter device of Claim ~~33~~32 wherein said membrane fiber wall has three mass density zones and wherein each of said zones is characterized by a different average nominal pore size.

54. (Currently amended) A filter device of Claim ~~33~~32 wherein said membrane fiber wall has four or more mass density zones and wherein each of said zones is characterized by a different average nominal pore size.

55. (Previously presented) A filter device of Claim 52, 53, or 54 having a lower mass density zone characterized by a nominal average pore diameter of between about 1 μm and about 60 μm .

56. (Previously presented) A filter device of Claim 52, 53, or 54 having a higher mass density zone characterized by a nominal average pore diameter of between about 0.3 μm and about 1 μm .

57. (Previously presented) A filter device of Claim 55 having a higher mass density zone characterized by a nominal average pore diameter of between about 0.3 μm and about 1 μm .

58. (Previously presented) A filter device of Claim 52 having a lower mass density zone wherein the nominal average pore diameter is between about 2 μm and about 6 μm .

59. (Previously presented) A filter device of Claim 52 having a higher mass density zone wherein the nominal average pore diameter is between about 0.4 μm and about 0.8 μm .

60. (Previously presented) A filter device of Claim 58 having a higher mass density zone wherein the nominal average pore diameter is between about 0.4 μm and about 0.8 μm .

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61. (Original) A filter device of Claim 60 having one or more intermediate mass density zones having a nominal average pore diameter of between about 0.8 μm and about 2 μm .

62. (Original) A filter device of Claim 61 having two intermediate mass density zones, a first intermediate zone having a nominal average pore diameter of between about 0.8 μm and about 1.2 μm and a second intermediate zone having a nominal average pore diameter of between about 1.2 μm and about 2 μm .

63. (Original) A filter device of Claim 49 wherein said higher mass density zone is characterized by a nominal average pore diameter of between about 0.005 μm and about 0.05 μm .

64-73. (Canceled)